

Contextual Influence of Anesthesia Nursing Care by the Anesthesia Care Team on Service Quality Among Anesthesia Patients

Muh. Anan Wais Lahay¹⁾, Adi Prayitno²⁾, Dewi Pratiwi³⁾,
Erindra Budi Cahyanto^{4,5)}, Sri Mulyani⁴⁾

¹⁾Master's of Public Health, Universitas Sebelas Maret, Indonesia

²⁾Department of Community Nutrition, Universitas Sebelas Maret, Indonesia

³⁾Department of Otorhinolaryngology, Head and Neck Surgery, Universitas Sebelas Maret, Indonesia

⁴⁾Department of Nursing Anesthesia, Universitas Sebelas Maret, Indonesia

⁵⁾Doctorate Degree Program in Public Health, Universitas Sebelas Maret, Indonesia

Received: March 1, 2026; Accepted: April 6, 2026; Available online: May 16, 2026

ABSTRACT

Background: The quality of general anesthesia care depends on the non-technical skills of nurse anesthetists and the socio-administrative factors of patients. This study aimed to analyze the relationships among emergency training status, clinical competence, health financing types, and patient satisfaction.

Subjects and Method: This study used an observational analytic cross-sectional design conducted at Dr. Moewardi Hospital, Surakarta, Central Java, Indonesia. The sample consisted of 19 nurse anesthetists selected through total sampling and 80 general anesthesia patients selected through consecutive sampling. Data were collected using modified Anaesthetists' Non-Technical Skills (ANTS) observation sheet and Rater questionnaire. Data analysis included One-Way ANOVA, Linear Regression, and mediation analysis using the PROCESS macro in SPSS.

Results: There was a significant difference between trained and untrained providers in anesthesia nursing care skills ($p < 0.001$) and patient satisfaction ($p = 0.004$). Patient satisfaction also varied significantly by financing type ($p = 0.034$). Linear regression indicated that training status predicted anesthesia nursing care scores ($p < 0.001$) and patient satisfaction ($p = 0.004$). However, anesthesia nursing care scores did not significantly predict patient satisfaction ($p = 0.061$). There was no significant relationship between provider training status and patient financing type ($p = 0.089$). Mediation analysis showed that financing type did not mediate the relationship between training status and patient satisfaction ($b = -1.61$; $p = 0.193$).

Conclusion: Emergency training improves both the non-technical skills of nurse anesthetists and patient satisfaction. Since intraoperative clinical competence does not directly predict post-operative satisfaction, hospitals should evaluate clinical safety and service quality as separate metrics. Furthermore, the findings indicate that anesthesia care is provided equally to all patients, regardless of their health financing type.

Keywords: anesthesia nursing care, general anesthesia, health financing, service satisfaction

Correspondence:

Adi Prayitno. Department of Community Nutrition, Faculty of Medicine, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta, Central Java 57126, Indonesia. Email: adiprayitno@staff.uns.ac.id.

Cite this as:

Lahay MAW, Prayitno A, Pratiwi D, Cahyanto EB, Mulyani S (2026). Contextual Influence of Anesthesia Nursing Care by the Anesthesia Care Team on Service Quality Among Anesthesia Patients. *Health Policy Manage.* 11(02): 243-253. <https://doi.org/10.26911/thejhp.2026.11.02.12>.



©Muh. Anan Wais Lahay. Published by Master's Program of Public Health, Universitas Sebelas Maret, Surakarta. This open-access article is distributed under the terms of the [Creative Commons Attribution 4.0 International \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/). Re-use is permitted for any purpose, provided attribution is given to the author and the source is cited.

BACKGROUND

The quality of anesthesia services is crucial for perioperative patient safety and optimal surgical outcomes. While clinical evaluation traditionally focused on physiological stability, modern healthcare standards emphasize that patient-centered care is equally important (WHO, 2019; Donabedian, 2003). Interpersonal communication and provider empathy shape a significant portion of the patient's perception of anesthesia quality (Weller et al., 2014). Therefore, measuring service quality must extend beyond biomedical outcomes to include dimensions such as reliability, assurance, tangibles, empathy, and responsiveness (RATER) to reflect the patient's actual experience (Parasuraman et al., 1988; Zeithaml et al., 2018).

Delivering safe anesthesia requires nurse anesthetists to possess strong non-technical skills (ANTS), which include teamwork, decision-making, and situational awareness. Research indicates that a large percentage of adverse events in the operating room are caused by non-technical errors rather than purely technical mistakes (Flin et al., 2010; Kang et al., 2024). In Indonesia, these skills are applied through the Anesthesia Nursing Care (ASKAN) framework. High proficiency in ASKAN helps providers anticipate clinical changes and manage hemodynamic transitions safely (Lyk-Jensen, 2014). Consequently, utilizing validated tools like the ANTS scoring system is necessary to objectively assess these critical clinical behaviors in the operating room.

Formal emergency training plays a vital role in developing these competencies. Advanced life support programs, such as Basic Trauma and Cardiac Life Support (BTCLS) or Advanced Cardiac Life Support (ACLS), improve the situational awareness and readiness of healthcare providers during perioperative emergencies (Sodhi et al., 2011;

Ruetzler et al., 2020). Regular training ensures that nurse anesthetists can manage clinical complications efficiently. This competence not only maintains intraoperative safety but also builds patient trust and satisfaction, as patients feel more secure when cared for by prepared and confident staff (Andemeskel et al., 2019).

In addition to clinical competence, patient satisfaction is influenced by socioeconomic factors and health financing systems (Simegn et al., 2021; Capuzzo et al., 2016). In Indonesia, the National Health Insurance (JKN) system categorizes participants into subsidized (PBI) and non-subsidized or independent (non-PBI) groups (Lubis, 2020; Handayani et al., 2022). Patients who pay independently often expect higher service quality, particularly regarding the tangible and responsive aspects of care, because they bear the direct financial cost (Nugroho & Santoso, 2024). Conversely, subsidized patients, who are protected from major hospital expenses, tend to have different baseline expectations. Recognizing this dynamic is important, as a patient's financial background can affect how they evaluate clinical interactions and their overall satisfaction with the anesthesia service.

Despite the established importance of clinical competence, training, and health financing, few studies have analyzed how these factors interact simultaneously. Most existing literature evaluates clinical performance, communication, and socio-economic variables in isolation (Aoyama et al., 2024). It remains unclear whether the positive effects of emergency training and clinical skills (ASKAN) on patient satisfaction are direct, or if they are mediated by the patient's financing type in a high-volume hospital setting. Understanding these structural relationships is necessary to improve hospital resource management and ensure equitable care.

Therefore, this study aims to analyze the relationships among nurse anesthetists' training status, ASKAN-ANTS clinical competence, and health financing types in determining service satisfaction for patients undergoing general anesthesia.

SUBJECTS AND METHOD

1. Study Design

This study used an observational analytic cross-sectional design to evaluate the determinants of anesthesia service quality (Levin, 2006). The research was conducted at RSUD Dr. Moewardi in Surakarta, Central Java, Indonesia. Data collection occurred over a two-month period, from September to October 2025.

2. Population and Sample

This study involved two populations, nurse anesthetists and post-anesthesia patients. The clinical staff population included all 19 active nurse anesthetists at the hospital, selected using the total sampling technique (N=19). The patient population consisted of individuals undergoing general anesthesia during the study period. From an estimated population of 100 patients, a sample of 80 was selected using consecutive sampling. Patient inclusion criteria were age 18 years or older, receipt of general anesthesia exclusively, full consciousness and cognitive stability post-operation, and clearly documented financing status. Patients requiring post-surgical intensive care (ICU) were excluded.

3. Research Variables

The dependent variable was the perceived quality of anesthesia services. The independent variables included the nurse anesthetists' training status, ASKAN competence (non-technical skills), and the patient's health financing type.

4. Operational Definition of Variables

Quality of anesthesia services was defined as the patient's perception of care in the recovery room after general anesthesia. It was measured using the five SERVQUAL dimensions: Reliability, Assurance, Tangibles, Empathy, and Responsiveness (RATER). To meet the requirements for regression and mediation analysis, this variable was analyzed as a continuous composite score derived from the questionnaire, rather than a categorical variable.

ASKAN competence referred to the non-technical clinical skills demonstrated by the nurse anesthetist during the intraoperative phase. This was quantitatively measured using a modified Anaesthetists' Non-Technical Skills (ANTS) observation tool, which assesses task management, teamwork, situational awareness, and decision-making.

Training status indicated the formal emergency life-support qualification of the nurse anesthetist. It was recorded as a dichotomous variable (Trained vs. Untrained) based on active certification in Basic Trauma Cardiac Life Support (BTCLS) or Advanced Cardiovascular Life Support (ACLS).

Financing type was defined as the administrative payment mechanism used to cover the patient's hospital expenses. Functioning as the mediator variable in this study, it was categorized into two groups: Subsidized Contribution Recipient (PBI/National Health Insurance) and Non-PBI (independent out-of-pocket payers)

5. Study Instruments

Data on ASKAN competence were collected during perioperative procedures using the modified Anaesthetists' Non-Technical Skills (ANTS) observational instrument (Fletcher et al., 2012). Anesthesia service quality was measured using the RATER (SERVQUAL) questionnaire, which was administered to patients in the surgical ward 12 to 24 hours post-anesthesia (Parasuraman et al., 1988). Data on the anesthetists' training status and

patients' financing types were systematically extracted from hospital administrative and medical records.

6. Data Analysis

Data were analyzed using IBM SPSS statistical software. Initially, univariate analysis was conducted to determine the frequency distributions and descriptive statistics of the respondents. Consistent with the study's methodology, patient demographic variables were strictly limited to age and formal education level to ensure measurement precision. To assess differences in ASKAN competence and perceived service quality based on training status and financing type, a One-Way Analysis of Variance (ANOVA) was used. Next, Ordinary Least Squares (OLS) linear regression models were applied to determine the direct predictive relationships between the independent variables (training status and clinical competence) and the dependent variable (patient satisfaction).

To evaluate the mediation pathway, a regression-based mediation analysis was performed using the PROCESS macro by Andrew F. Hayes (Hayes, 2022). This method was used to calculate indirect effects and determine whether financing type acts as a contextual mediator between clinical competence and service quality. A p-value of <0.05

was considered statistically significant for all analyses.

7. Research Ethics

This study strictly adhered to standard research ethics principles, including informed consent, anonymity, confidentiality, beneficence, and justice. Participation was completely voluntary, and all respondents provided written informed consent before data collection. The study protocol was approved by the Health Research Ethics Committee at Dr. Moewardi Hospital, Surakarta, Indonesia, under ethical clearance number 1.987 / IX / HREC / 2025, dated September 16, 2025.

RESULTS

1. Sample Characteristics

Table 1 presents the demographic and professional characteristics of the 19 nurse anesthetists who participated in the study. The sample comprised predominantly males ($n = 12$, 63.2%), compared with females ($n = 7$, 36.8%). Regarding educational background, more than half of the respondents held a Bachelor of Nursing with a Professional Qualification ($n = 10$, 52.6%). Emergency training status was relatively evenly distributed, with 10 nurse anesthetists (52.6%) holding active BTCLS/ACLS certifications (trained) and 9 (47.4%) without certification (untrained).

Table 1. Sample Characteristics of Anesthetists (n = 19)

Variables	Frequency (n)	Percentage (%)
Anesthetist Gender		
Male	12	63.0
Female	7	37.0
Anesthetist Education		
Diploma III in Nursing	2	10.5
Diploma III in Anesthesia Nursing	3	16.0
Diploma IV in Anesthesia Nursing	4	21.0
Bachelor of Nursing / Professional Nurse	10	52.5
BTCLS/ACLS Training Status		
Trained	10	53.0
Untrained	9	47.0

Table 2 outlines the demographic, clinical, and administrative characteristics of the 80 patient respondents. Demographically, the sample consists of 43 females (53.8%) and 37 males (46.3%). The respondents' educational backgrounds are distributed across several levels, primarily consisting of elementary school graduates (32.5%) and bachelor's degree holders (21.3%). Additionally, the occupational profile includes private sector employees (27.5%), housewives (23.8%), and farmers (20.0%).

Clinically, the respondents presented with stable preoperative conditions, classified

under ASA I (61.3%) and ASA II (38.8%) physical statuses. Consistent with the defined inclusion criteria, this research focuses exclusively on the care dynamics of patients undergoing general anesthesia. Administratively, the distribution of health financing types, which served as the mediating variable, indicated that 61.3% of patients utilized the National Health Insurance (JKN), while 38.8% were non-JKN payers. This administrative categorization provides a clear socioeconomic baseline for evaluating the patients' perceived service quality.

Table 2. Sample Characteristics of Patients (n = 80)

Variables	Frequency (n)	Percentage (%)
Gender		
Male	37	46.3
Female	43	53.8
Education		
Elementary school	26	32.5
Junior high school	8	10.0
Senior/vocational high school	18	22.5
Diploma	10	12.5
Bachelor's degree	17	21.3
Master's degree	1	1.3
Type of Anesthesia		
Spinal	39	48.8
General	41	51.2
American Society of Anesthesiologists (ASA) physical status classification		
ASA I	49	61.3
ASA II	31	38.8
Occupation		
Housewife	19	23.8
Farmer	16	20.0
Civil servant	10	12.5
Private-sector employee	22	27.5
Laborer	3	3.8
Self-employed/entrepreneur	3	3.8
Other	3	3.8
Unemployed	4	5.0
Financing Type		
National health insurance	49	61.3
Non- National health insurance	31	38.8

Table 3 presents the descriptive statistics for non-technical clinical competence and patient-perceived service quality. Non-

technical clinical competence among anesthesia providers, measured using the ASKAN-ANTS instrument, had a mean score

of 7.534 (SD = 0.905), with scores ranging from 5.80 to 9.50. Patient-perceived service quality, measured using the RATER questionnaire, had a mean score of 4.555 (SD=

0.478), with scores ranging from 3.00 to 5.00.

Table 3. Descriptive Statistics of Research Variables (n = 80)

Variable	Mean	SD	Min.	Max.
ASKAN-ANTS Score	7.53	0.91	5.80	9.50
RATER Score	4.56	0.48	3.00	5.00

2. Bivariate Analysis

Table 4 presents the results of the simple linear regression analyses. Training status was significantly associated with the ASKAN-ANTS score ($r=0.53$; $p<0.001$). Training status was also significantly associated with service satisfaction measured using RATER

($r= 0.32$; $p=0.004$). In addition, financing type was significantly associated with service satisfaction ($r=0.24$; $p=0.034$). In contrast, the ASKAN-ANTS score was not significantly associated with service satisfaction ($r= 0.21$; $p=0.061$).

Table 4. Simple linear regression analysis of factors associated with and health service satisfaction

Outcome variables	Independent variable	r	p
Service Satisfaction	Training Status	0.31	0.004
Service Satisfaction	Financing Type	0.24	0.034
Service Satisfaction	ASKAN Score	0.21	0.061
ASKAN-ANTS Score	Training Status	0.53	<0.001
Financing Type	Training Status	0.19	0.089

3. Multivariate Analysis

Table 6 shows that the indirect effect of training status on health service satisfaction through financing status was not statistically

significant ($b = -1.61$, $p = 0.193$). This finding indicates that financing status did not significantly mediate the association between training status and health service satisfaction.

Table 6. Results of Mediation Analysis (PROCESS Macro by Andrew F. Hayes)

Independent Variable	Mediator Variable	Dependent Variable	b	p
Training status	Financing type	Health service satisfaction	-1.61	0.193

DISCUSSION

1. Impact of training status on clinical competence

Formal emergency training was significantly associated with non-technical clinical competence among nurse anesthetists. The linear regression analysis demonstrated a significant relationship between training status and ASKAN-ANTS scores, suggesting that nurse anesthetists with formal emergency training, such as BTCLS or ACLS certification, tended

to demonstrate higher levels of non-technical clinical competence. Such training may strengthen cognitive and behavioral skills relevant to situational awareness, decision-making, teamwork, and task management during perioperative care, which represent key domains of non-technical skills in anesthesia practice. These findings highlight the potential importance of continuing professional training in strengthening non-

technical competencies and supporting patient safety in anesthesia care (Kang et al., 2024).

The balanced demographic distribution of the clinical staff supports this finding. With the sample nearly evenly divided between trained (53.0%) and untrained (47.0%) providers, the one-way ANOVA confirms a significant difference in clinical performance. This variance suggests that non-technical skills are not solely the result of clinical experience but are developed through structured training. Consequently, hospital administrators should prioritize mandatory certification renewals to measure and maintain workforce competency (Ruetzler et al., 2020).

2. Direct influence of training and financing on satisfaction

Beyond clinical proficiency, formal emergency training was associated with patient-perceived service quality. The analysis demonstrated a moderate and statistically significant relationship between training status and RATER service quality scores, indicating that nurse anesthetists with formal BTCLS/ACLS training had different levels of patient-perceived service quality compared with those without such training. One possible explanation is that formal training may strengthen communication, confidence, teamwork, and assurance-related behaviors, which can influence how patients perceive the quality of care they receive. In the perioperative setting, these interpersonal and non-technical competencies may also contribute to patients feeling more informed and reassured before anesthesia induction. Thus, the observed association suggests that emergency training may have relevance beyond technical preparedness, extending to aspects of the patient experience. However, because the study design does not establish causality, the relationship should be interpreted as an association rather than evidence that training

directly improves service quality (Andemeskel et al., 2019).

Patient-perceived service quality was also associated with health financing status. The analysis indicated a statistically significant difference in RATER scores according to financing status, suggesting that patients using National Health Insurance (JKN) and those paying through non-JKN financing arrangements may perceive aspects of service quality differently. Although the F-value for financing status was lower than that observed for training status, the association remained statistically significant, indicating that financing status contributed to variation in perceived service quality. Differences in patients' expectations, experiences of access, and perceptions of responsiveness or tangible aspects of care may partly explain this variation. These findings highlight the importance of considering patients' financing arrangements when evaluating perceived hospital service quality, while recognizing that financing status should not be interpreted as a direct measure of socioeconomic status (Simegn et al., 2021).

Despite the observed association between financing status and patient-perceived service quality, the analysis did not identify a statistically significant association between provider training status and patients' financing status. This finding indicates that training status was not significantly related to financing status within the study sample. Therefore, the results do not provide evidence that provider training status differed systematically according to patients' financing arrangements. However, this non-significant finding should not be interpreted as proof of equitable resource allocation, as the study did not directly assess the hospital's allocation practices or other dimensions of resource distribution. Further research with larger samples and measures of institutional resource allocation would be needed to

evaluate whether anesthesia care is distributed equitably across financing groups (Aoyama et al., 2024).

3. Non-Technical Competence and Patient-Perceived Service Quality

A notable finding was that ASKAN-ANTS scores were not significantly associated with RATER scores, indicating that objectively assessed non-technical competence did not correspond to differences in patient-perceived service quality in this sample. This result should not be interpreted as evidence that non-technical competence has no influence on patient experience, particularly given the cross-sectional design and limited sample size. One possible explanation is that several aspects of anesthesia care, especially those occurring during general anesthesia, are not directly observable to patients, limiting their ability to assess providers' situational awareness, decision-making, and task management during the intraoperative period (Meyer et al., 2021).

The finding also reflects the different dimensions assessed by the two instruments. ASKAN-ANTS focuses on provider competencies such as situational awareness, decision-making, communication, teamwork, and task management, whereas RATER assesses patients' perceptions of reliability, assurance, tangibles, empathy, and responsiveness. Patient evaluations may therefore be shaped more strongly by directly experienced aspects of care, including preoperative communication, interpersonal interactions, responsiveness, and postoperative care. Using both provider- and patient-oriented measures may consequently provide a more comprehensive assessment of anesthesia care quality (Leslie et al., 2017).

4. The non-significant mediating role of financing status

The mediation analysis did not support the hypothesis that financing status mediates the association between clinical training and

patient-perceived service quality. The indirect pathway was not statistically significant, indicating that the relationship between training status and patient satisfaction was not explained through differences in financing status. This finding should not be interpreted as evidence of a direct or causal effect of training on satisfaction; rather, it indicates that financing status did not function as a statistically supported mediator in the hypothesized pathway. Moreover, financing status represents patients' healthcare payment arrangements and should not be equated directly with socioeconomic status (Capuzzo et al., 2016).

The absence of a significant mediation pathway suggests that differences in patient-perceived service quality associated with training status, where present, cannot be attributed to financing status as an intermediary mechanism. Although financing status was independently associated with service satisfaction, its indirect role between provider training and perceived service quality was not statistically supported. One possible explanation is that standardized perioperative communication and patient-centered interactions are provided across different financing arrangements, potentially reducing differences in patients' experiences attributable to administrative payment categories. However, this interpretation remains exploratory and should be examined in larger studies with more comprehensive measures of socioeconomic and institutional factors (Garg et al., 2020)..

5. Implications for healthcare policy and management

These findings suggest a dual approach to human resource management in anesthesia services. The observed association between training status and both non-technical competence and patient-perceived service quality indicates the value of addressing clinical and patient-centered competencies

together. Hospitals may consider maintaining relevant life-support training and certification while also strengthening communication, empathy, and interpersonal skills during the pre- and post-anesthesia phases. Integrating clinical competency requirements with patient-centered service training may support a more comprehensive approach to anesthesia care quality (Zeithaml et al., 2018).

This study has several limitations, including its cross-sectional and single-center design, the relatively small number of nurse anesthetists and patients, and the use of consecutive sampling, which may limit causal inference and the generalizability of the findings. In addition, potential confounding factors related to patients, providers, and organizational characteristics were not fully accounted for, while the use of a modified ANTS instrument and patient-reported service quality may introduce measurement and response bias. The mediation findings should also be interpreted cautiously because the cross-sectional design cannot establish the temporal sequence between exposure, mediator, and outcome. Nevertheless, the findings highlight the importance of strengthening non-technical competencies among nurse anesthetists and routinely evaluating patient-perceived anesthesia service quality.

Future studies should use prospective or longitudinal designs, involve larger samples from multiple healthcare settings, incorporate relevant patient-, provider-, and organizational-level confounders, and use validated measurement instruments. Further research should also examine the relationships among training, non-technical competence, and service quality using analytical approaches that appropriately account for contextual factors and the temporal sequence of the variables.

AUTHOR CONTRIBUTIONS

Muh. Anan Wais Lahay: conceptualization, formal analysis, writing – original draft

Adi Prayitno: Methodology, writing – review and editing

Dewi Pratiwi: Data curation, writing – review and editing

Erindra Budi Cahyanto: Supervision

Sri Mulyani: Supervision

CONFLICT OF INTEREST

The author declares that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

FUNDING AND SPONSORSHIP

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ACKNOWLEDGEMENT

The author expresses gratitude to the medical staff—particularly the nurse anesthetists—at the Central Surgical Installation of Dr. Moewardi Hospital, Surakarta, Indonesia, for their cooperation during data collection.

REFERENCES

- Andemeskel YA, Elsholz K, Gebreyohannes Y, Tefamariam T (2019). Patient satisfaction with perioperative anesthesia care and associated factors at a national referral hospital. *BMC Anesthesiol.* 19(1): 1–9. <https://doi.org/10.1186/s1-2871-019-0724-3>.
- Aoyama K, Yang A, Pinto R, Ray JG, Hill A, Scales DC, Fowler RA (2024). Using multi-level regression to determine associations and estimate causes and effects in clinical anesthesia due to patient, practitioner and hospital or health system practice variability. *J Anesth.* 39: 134–145. <https://doi.org/10.1007/s00540-024-03408-3>.

- Capuzzo M, Gilli G, Paparella L, Gritti G, Salcuni S, et al. (2007). Factors predictive of patient satisfaction with anesthesia. *Anesth Analg*. 105(2): 435–442. <https://doi.org/10.1213/01.ane.0000270207.69831.33>.
- Donabedian A (2003). *An introduction to quality assurance in health care*. New York: Oxford University Press.
- Field A (2017). *Discovering statistics using IBM SPSS statistics*. 5th ed. London: SAGE Publications.
- Fletcher G, Flin R, McGeorge P, Glavin R, Maran N, Patey R (2003). Anaesthetists' non-technical skills (ANTS): Evaluation of a behavioural marker system. *Br J Anaesth*. 90(5): 580–588. <https://doi.org/10.1093/bja/aeg112>.
- Flin R, Patey R, Glavin R, Maran N (2010). Anaesthetists' non-technical skills. *Br J Anaesth*. 105(1): 38–44. <https://doi.org/10.1093/bja/aeq134>.
- Weller J, Boyd M, Cumin D (2014). Teams, tribes and patient safety: Overcoming barriers to effective teamwork in health-care. *Postgrad Med J*. 90(1061): 149–154. <https://doi.org/10.1136/postgrad-medj-2012-131168>.
- Handayani R, Setyawan D, Mustofa A (2022). Analysis of central surgical service utilization among JKN patients at a referral hospital. *J Manaj Kesehat Indones*. 10(2): 120–128.
- Hayes AF (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. 3rd ed. New York: Guilford Press.
- Jarl M, Escher C, Harbut P, Conte H, Nilsson U (2025). Psychometric evaluation of a structured assessment tool for nurse anesthetists' non-technical skills. *BMC Med Educ*. 25(1): 72. <https://doi.org/10.1186/s12909-025-07297-2>.
- Kang J, Hu J, Yan C, Xing X, Tu S, Zhou F (2024). Development and applications of the Anaesthetists' Non-Technical Skills behavioural marker system: A systematic review. *BMJ Open*. 14(3): e075019. <https://doi.org/10.1136/bmj-open-2023-075019>.
- Levin KA (2006). Study design III: Cross-sectional studies. *Evid Based Dent*. 7(1): 24–25. <https://doi.org/10.1038/sj-ebd.6400375>.
- Lubis A (2020). *Hospital policy and governance in the JKN era*. Jakarta: Kencana.
- Lyk-Jensen HT, Jepsen RMHG, Spanager L, Dieckmann P, Ostergaard D (2014). A Danish version of the Anaesthetists' Non-Technical Skills (ANTS) behavioural marker system: Translation, adaptation and validation. *Acta Anaesthesiol Scand*. 58(10): 1282–1289. <https://doi.org/10.1111/aas.12404>.
- Parasuraman A, Zeithaml VA, Berry LL (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *J Retail*. 64(1): 12–40.
- Ruetzler K, Khanna AK, Sessler DI (2020). Myocardial Injury After Noncardiac Surgery: Preoperative, Intraoperative, and Postoperative Aspects, Implications, and Directions. *Anesthesia & Analgesia*. 131(1): 173–186. <https://doi.org/10.1213/ANE.0000000000004567>.
- Simegn AE, Melesse DY, Bizuneh YB, Alemu WM (2021). Patient satisfaction survey on perioperative anesthesia service. *Anesthesiol Res Pract*. 2021: 3379850. <https://doi.org/10.1155/2021/3379850>.
- Sodhi K, Singla MK, Shrivastava A (2011). Impact of advanced cardiac life support training program on the outcome of cardiopulmonary resuscitation in a tertiary care hospital. *Indian J Crit Care Med*. 15(4): 209–212. <https://doi.org/10.4103/0972-5229.92070>.
- World Health Organization (2019). *Patient*

safety: Global action on patient safety.
Geneva: World Health Organization.

Zeithaml VA, Bitner MJ, Gremler DD (2018).
Services marketing: Integrating

customer focus across the firm. 7th ed.
New York: McGraw-Hill Education.